

A STUDY OF AWARENESS AND ASSOCIATED RISK FACTORS OF DIABETIC RETINOPATHY IN DIABETICS OF RURAL POPULATION

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ABSTRACT

AIMS AND OBJECTIVES

To create awareness about the Diabetes and Diabetic Retinopathy (to reduce the Morbidity and Mortality), to assess the Risk Factors associated with Diabetics impacting the Diabetic Retinopathy, to estimate the Prevalence of Diabetic Retinopathy among the rural diabetics of Ramanagara and Chikkaballapura districts of Karnataka, India.

METHODS

It is a Community Based Non Randomized Prospective Study for period of 18 months from October 2013 to May 2015. All diabetics from five taluks of Chikkaballapura and four taluks of Ramanagara were examined on predetermined date and time at taluk hospitals. Detailed history, detailed ocular examination, with height, weight, blood pressure, Fasting Blood Sugar were recorded in a proforma with a structured questionnaire on awareness of Diabetes and Diabetic Retinopathy. Diabetic Retinopathy was clinically graded according to Early Treatment Diabetic Retinopathy Study (ETDRS) classifications.

RESULTS

655 patients were examined with male preponderance and prevalence of DR was found to be 20.46% (134) in Rural Diabetic Population belonging to Ramanagara and Chikkaballapura districts, out of which 79.13% (106) was NPDR and 20.86% was PDR.

The prevalence of DR increases with FBS level >140 mg/dl, with increase in Duration in diabetes, with Insulin Usage with Hypertension, with increase in BMI >25, and in Smoker's. The awareness of DR among Rural Diabetics was found to be 38.7% (250), with female's having better awareness level. The awareness among rural diabetics for Annual Retinal Examination was found to be 18.6% (119), with female's having better awareness level.

CONCLUSION

As Diabetic Retinopathy is becoming an important cause for visual disability in India. Considering the large burden of DR in Rural Population with Rural communities having limited access to medical services. Preventive measures have to be taken by screening programmes in rural population to identify DR at the earliest, to modify the course of the disease by timely interventions and management and to create awareness among the rural diabetics for regular eye check-ups and amongst health professionals about timely referral for DR evaluation, to reduce the burden of visual loss due to Diabetic Retinopathy.

KEYWORDS

Diabetic Retinopathy, Rural Diabetic Screening, Diabetic Macular Oedema, Fasting Blood Sugar, CSME, BMI.

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INTRODUCTION: Diabetes mellitus is defined as a metabolic disorder of multiple aetiologies characterised by chronic hyperglycaemia with disturbances of carbohydrate, protein and fat metabolism resulting from defects in insulin secretion, insulin action, or both.¹

Diabetic retinopathy is a chronic progressive, potentially sight-threatening disease of the retinal microvasculature associated with the prolonged hyperglycaemia and other conditions linked to diabetes mellitus such as hypertension.² Diabetic retinopathy is the leading cause of blindness among individuals between 25 and 74 years of age in the industrialized world. It affects three out of four diabetic patients after 15 years of disease duration. Chronic hyperglycaemia is the primary factor leading to the development of diabetic retinopathy and other complications of the disease. The importance of long term glycaemic control has been conclusively established in the landmark clinical trials including the Diabetes Control and Complications Trial (DCCT) at the UK Prospective Diabetes Study (UKPDS).^{3,4}

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Diabetic retinopathy (DR) is a vascular disorder affecting the microvasculature of the retina.⁵ It occurs both in type 1 and type 2 Diabetes Mellitus and has been shown that nearly all type 1 and 75% of type 2 diabetes mellitus will develop Diabetic Retinopathy after 15 yrs. duration of diabetes.

India is known as the "diabetes capital of the world".⁶ With a Diabetic population of 40.9 million (highest in the world for any country). India is facing a tough challenge. It is projected that it will rise to 79.4 million by the year 2030. Diabetic retinopathy is fast becoming an important cause of visual disability in India. The risk of blindness is 25 times higher in diabetics. In India DR was 17th cause of blindness 20 yrs. ago, but now has ascended to 6th position.

Diabetes mellitus (DM) is a global epidemic with significant morbidity. Diabetic retinopathy (DR) is the specific microvascular complication of DM and affects 1 in 3 persons with DM. DR remains a leading cause of vision loss in working adult populations. Patients with severe levels of DR are reported to have poorer quality of life and reduced levels of physical, emotional, and social well-being, and they utilize more health care resources.⁷

Epidemiological studies and clinical trials have shown that optimal control of blood glucose, blood pressure, and blood lipids can reduce the risk of developing retinopathy and slow its progression. Timely treatment with laser photocoagulation, and increasingly, the appropriate use of intraocular administration of vascular endothelial growth factor (VEGF) inhibitors can prevent visual loss in vision-threatening retinopathy, particularly diabetic macular oedema (DME). Since visual loss may not be present in the earlier stages of retinopathy, regular screening of persons with diabetes is essential to enable early intervention.⁷

Rural communities have limited access to medical services, which leads to poor control of diabetes and the living condition is markedly different when compared to urban. Many previous studies have been performed in urban areas, when compared to rural, where lesser studies have been done regarding prevalence of diabetic retinopathy.⁸ Awareness regarding diabetic retinopathy is less among the rural population. Understanding the prevalence of diabetic retinopathy is important because it is a key indicator of systemic diabetic microvascular complications and as such, a Sentinel Indicator of the impact of diabetes.

AIMS: To create awareness about the Diabetes and Diabetic Retinopathy (to reduce the Morbidity and Mortality), to assess the Risk Factors associated with Diabetics impacting the Diabetic Retinopathy, to estimate the Prevalence of Diabetic Retinopathy among the rural diabetics of Ramanagara and Chikkaballapura districts of Karnataka, India.

MATERIALS AND METHODS: It is a Community Based Non Randomised Prospective Study for period of 18 months from October 2013 to May 2015. Two districts of Karnataka i.e. Ramanagara and Chikkaballapura were selected for pilot project. Ramanagara and Chikkaballapura has 4 and 5 taluks. Every month one taluk of each district were selected and the Respective taluk medical officer would have screened the Diabetics from the General Population by doing Fasting Blood Sugar and Post Prandial Blood Sugar. Established Old Diabetics and Newly Detected Diabetics detected through screening were allotted a specific date and informed to come on the specific day for detailed Evaluation. The details of the patients are collected in a Proforma containing, name, age, sex, address, occupation, contact number, BMI, Family History, Diet, Height, Weight, Detailed Diabetic History, Habits, BP, Exercises, Associated Medical Conditions and Comorbidities, questionnaire for assessing the Knowledge, Awareness and Practice will be noted. All diabetics were tested for visual acuity using Snellen's chart/Illiterate E Chart. Anterior segment was examined by Slit Lamp Biomicroscopy. All diabetic patients were subjected to dilated fundus evaluation using both Direct and Indirect Ophthalmoscope. Documentation of Diabetic Retinopathy changes was done. Diabetic Retinopathy was clinically graded according to the Early Treatment Diabetic Retinopathy Study (ETDRS). Awareness meetings were held at the end of sessions and patients were educated regarding in the form of Knowledge, Attitude and Practice, Awareness: about the Diabetes and Diabetic Retinopathy, Educated: about the importance of Life Style Modification, Annual Eye Check-ups and the control of risk factors, Motivated: to attend the camp regularly. Further investigations, digital fundus photography and management were done at base hospital. Patients diagnosed with Clinically Significant Macular Oedema (CSME) and Proliferative Diabetic Retinopathy (PDR) requiring Emergency Laser treatment are brought to the Base Hospital and documentation done by Digital Fundus Photography and further detailed evaluation like OCT and FFA are done and Emergency Laser Treatment are given. The patients with no diabetic retinopathy changes were asked for regular annual check-up. Mild to moderate diabetic retinopathy patients were asked to review with HBA_{1c}, Lipid profile, FBS and PPBS reports after 6 months. Very severe and PDR patients were referred to tertiary care center hospital for further management.

DIABETIC RETINOPATHY CAMP AREA : RAMANAGARA/CHIKKABALLAPURA Date: _____

Name: _____

Age/Sex: _____

Occupation: _____ Family History: F / M / B / S/ Son/Daughter

Address: _____ Diet: Non Veg (Red Meat / Non Red Meat) / Veg

Height: _____ Weight: _____ BMI: _____

Diabetic History: k/c/o DM _____ Yrs / Recently Diagnosed since _____

Diabetic Detection: On Clinical Suspicion/ On Routine Examination GRBS: _____ mg%

Treatment: OHD/Insulin/No Treatment Habits: Smoker/Alcoholic/Tb.Chewing/others/NO

BP: _____ mm Hg Exercises: Walking/Yoga/Cycling/others/NO

Other Associated Medical conditions: HTN/cardiac disease/others

AWARENESS ABOUT:

- Disease
- Multisystem Involvement
- Involvement of Eyes

OCULAR EXAMINATION	RIGHT	LEFT
VISUAL ACUITY : For Distant Vision For Near Vision With Spectacles		
ANTERIOR SEGMENT: PUPIL:		
FUNDUS EXAMINATION: (IDO)	○	○

IMPRESSION: RE : _____
LE : _____

ADVICE: _____

RESULTS: Prevalence of Diabetic Retinopathy was found to be 20.46% (134) in the Rural Diabetic Population (655) belonging to Ramanagara and Chikkaballapura Districts with Male Preponderance (Fig No. 2). Out of which, 79.13% (106) was NPDR and 20.86% (28) was PDR (Fig No. 3). The Prevalence of Diabetic Retinopathy with FBS <140 mg/dl was 7.11% (17), with FBS>140 mg/dl was 28.12% (117) (Fig No., 4). The Prevalence of DR with duration of Diabetes, 0-5 yrs. was 9.46% (30), 6-10 yrs. was 17.68% (26), 11-15 yrs. was 26.66% (24), >15 yrs. was 53.46% (54) (Fig No. 5). The Prevalence of DR with BMI>.25 was 28.45% (70) and with BMI <25 was found to be 15.64% (64) (Fig No., 6). The Prevalence of DR in Smoker was found to be 41.20% (75) and in Non-Smoker was found to be 12.47% (59) (Fig No. 7). The Prevalence of DR in Diabetics with Hypertension was found to be 41.50% (110) and in Diabetics with No Hypertension was found to be 6.1% (24) (Fig No. 8). The Prevalence of DR in Insulin User Diabetics was found to be 51.72% (30) and in Non-Insulin User Diabetics was found to be 17.42% (104) (Fig No. 9). The awareness of DR among Rural diabetics was found to be 38.7% (250), the awareness among male was 37.46% (154) and female was 39.34% (96)

The awareness among rural diabetics of annual retinal examination was found to be 18.16% (119), the awareness among male was 16.78% (69) and female was 20.49% (50).

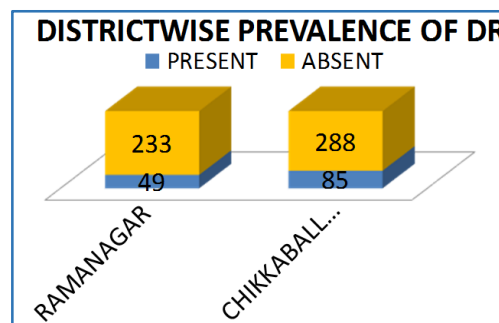


Fig. 1: District wise prevalence: 655 patients

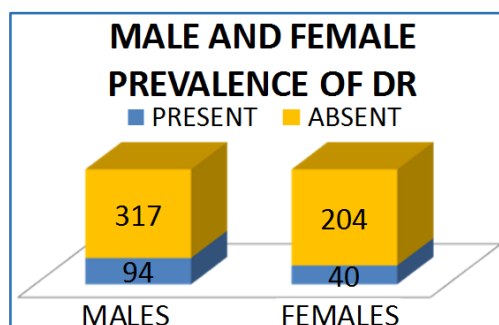


Fig. 2: Gender distribution of types of diabetic retinopathy

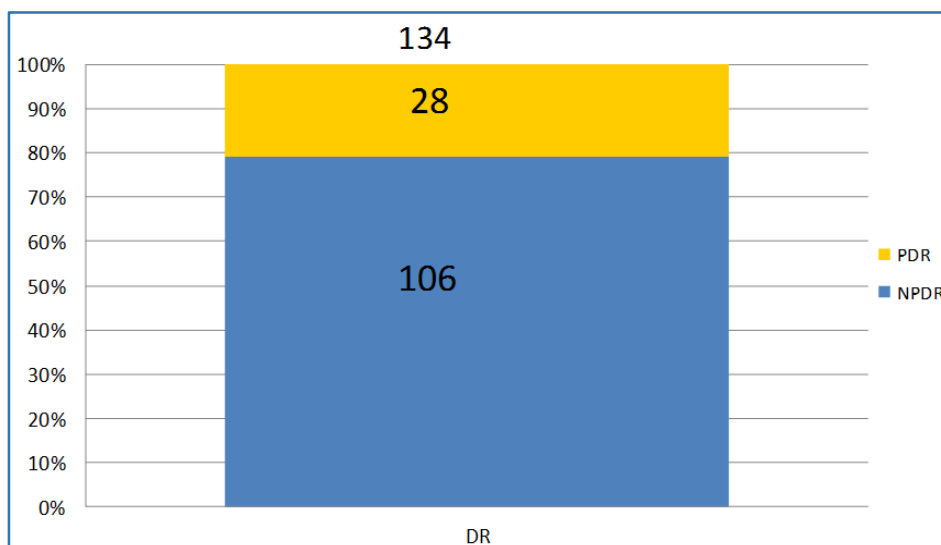


Fig. 3: NPDR and PDR Distribution

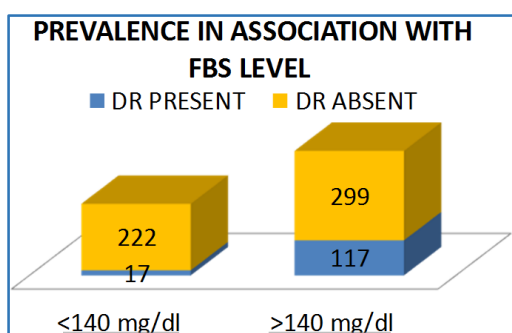


Fig. 4: Prevalence according to FBS levels

Chi-squared Test for Independence, P value <0.0001.

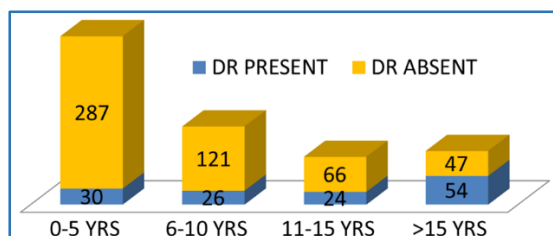


Fig. 5: Prevalence according to duration of diabetes

Chi-squared Test for Independence, P value <0.0001.

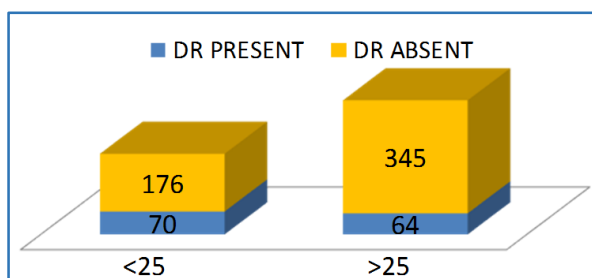


Fig. 6: Diabetic retinopathy prevalence according to BMI

Chi-squared Test for Independence, P value <0.0001.

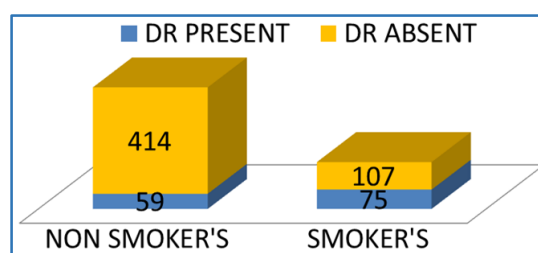


Fig. 7: Diabetic retinopathy prevalence according to smoking

Chi-squared Test for Independence, P value <0.0001.

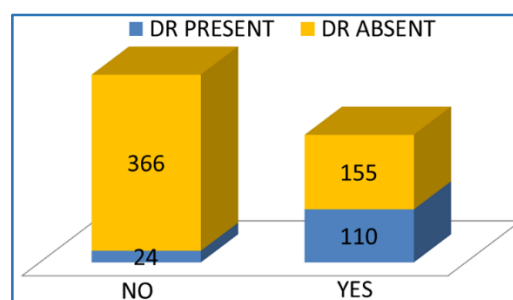


Fig. 8: Prevalence of Dr. in association with hypertension

Chi-squared Test for Independence, P value <0.0001.

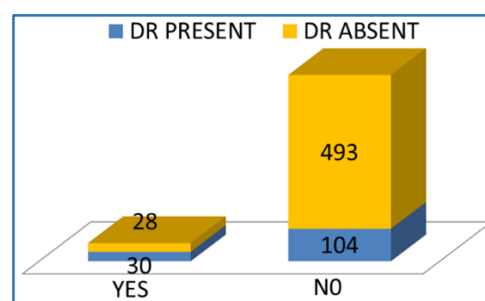


Fig. 9: Prevalence of Dr. in association with insulin status

Chi-squared Test for Independence, P value <0.0001.

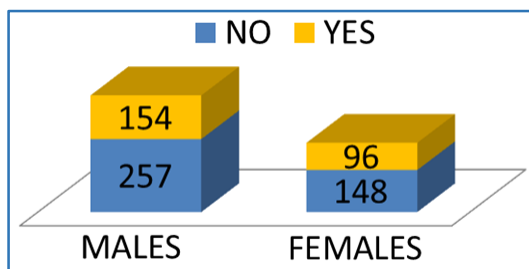


Fig. 10: Awareness of Dr among rural diabetics males and females

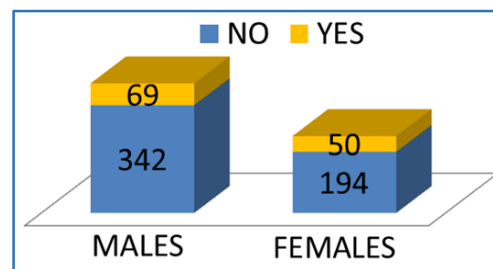


Fig. 11: Awareness among rural diabetics about the need for annual retinal examination

DISCUSSION: The prevalence of Diabetic Retinopathy in Rural Diabetic population is significantly high, prevalence increases with increase in duration of diabetes and with Fasting Blood Sugar >140 mg/dl, when compared to other studies (Table 1). The Prevalence of Diabetic Retinopathy increases with Insulin Usage, with Hypertension and in Smoker's (Table 2). The Awareness of DR in rural diabetic population is less (37/1%), correlating with previous study and with females' awareness better than males (Table 3).

Study	Prevalence	Duration of DM (Yrs.)				Prevalence with FBS (mg/dl)	
		<5	5-10	10-15	>15	<140	>140
Our Study	20.46%	9.46%	17.68%	26.66%	53.46%	7.11%	28.12%
SN-Dreams III ⁹	10.3%	6.3%	18.1%	27.8%	37.1%	-	-
Suraj eye hospital ¹⁰	5-6%	-	-	-	-	-	-
Aravind eye hospital ¹¹	12.2%	14.3%	38.7%	14.9%	26.3%	-	-

Table 1

Study	Prevalence in association with insulin status		Prevalence in association with hypertension	
	Non-insulin User	Insulin user	No	Yes
Our Study	17.42%	51.72%	6.1%	41.50%
Aravind Eye Hospital ¹¹	9.4%	44%	8.6%	19.8%

Table 2

Study	Awareness of Dr	Awareness about annual retinal examination
Our study	38.7%	18.16%
Shankara Nethralaya Study ¹²	37.1%	-

Table 3

CONCLUSION: Prevalence of diabetic retinopathy in rural population is significantly high compare to previous studies which is affected by the glycaemic control state and associated risk factors. Awareness level about DR and need for Annual Examination is low amongst the rural diabetics.

Considering the large burden of diabetic retinopathy is important to identify them at the earliest by screening programmes to modify the course of the disease. To create awareness among health professionals about timely referral for evaluation. Educate all diabetics for regular follow-up and control of blood sugars.

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